amendment to claim 9 merely clarifies the recited compound containing boron and oxygen consistent with the paragraph bridging pages 10 and 11 of the written description of the specification. Applicants submit that the present Amendment does not generate any new matter issue.

Claims 1, 2 and 4 through 8 were rejected under 35 U.S.C. §102 for lack of novelty or, alternatively, under 35 U.S.C. §103 for obviousness predicated upon each of U.S. Patent No. 5,691,260 (Suzuki '260) and JP '09059068 (JP '068).

In the statement of the rejection, the Examiner asserted that no evidence has been presented to demonstrate that the prior art sintered cubic boron nitride articles do not necessarily exhibit the properties recited in the claims. This rejection is traversed as factually and legally erroneous.

Procedural Due Process of Law

The Examiner is charged with the initial burden of establishing a prima facie basis to deny patentability to a claimed invention under any statutory provision. *In re Mayne, 104 F.3d 1339, 41 USPQ2d 1451 (Fed. Cir. 1997); In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992); In re Piasecki, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984).* Applicants are under no burden to proffer any objective evidence whatsoever, or even offer a rebuttal, until such time as the Examiner has established a prima facie basis to deny patentability to the claimed invention. *In re Deuel, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); In re Oetiker, supra.* To insist on objective rebuttal

evidence before establishing a prima facie basis to deny patentability to the claimed invention denies Applicants procedural due process of law.

There is no Prima Facie Case Under 35 U.S.C. §102 or 35 U.S.C. §103

As stressed in the Amendment submitted October 5, 2001, the Examiner has not, and can not, point to "page and line", as judicially required, wherein either of the applied references discloses or suggests a sintered cubic boron carbide satisfying the requirements of claim 1, particularly as now amended. *In re Rijckaert, supra.* The Examiner falls back on the doctrine of inherency. However, as also pointed out in the October 5, 2001 Amendment, inherency requires **certain** *Finnegan Corp. v. ITC, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999); Electro Medical Systems S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 20 USPQ2d 1746 (Fed. Cir. 1991); In re Oelrich, 666 F.2d 578, 212 USPQ 323 (CCPA 1981).* That the Examiner must do something more than invoke the doctrine of inherency. The Examiner must provide a basis in **fact** upon which to invoke the doctrine of inherency, which requires **certainty**, by pointing to "page and line" of the applied prior art wherein which justifies invocation of the inherency theory. *Ex parte Schricker, 56 USPQ2d 1723, 1725 (BPAI 2000).* That burden has also not been discharged.

The Examiner **assumes** that any sintered cubic boron nitride article having overlapping composition and grain size **necessarily** exhibits the diffraction intensity ratio, thermal conductivity and transverse rupture strength specified in claim 1, let alone the hardness specified in claim 4, the thermal conductivity specified in claim 5, and the thermal expansion coefficient specified in claim 6. But something more is required than assumption. *Ex parte Schricker,*

supra. What is required is a factual bases upon which to predicate the determination that the allegedly inherent features **necessarily** exist in the prior art sintered cubic boron nitride articles. Applicants would emphasis the word **necessarily**. *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 20 USPQ2d 1746 (Fed. Cir. 1991); In re Oelrich, 666 F.2d 578, 212 USPQ 323 (CCPA 1981).*

The Examiner committed clear **legal error** in ignoring the data in the specification which undermine the Examiner's notion of inherency. *In re Glaug Appeal No. 00-1571(Fed. Cir. 2002); In re Soni, 54 F.3d 746, 34 USPQ2d 1685 (Fed. Cir. 1995); In re Margolis, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986).* Specifically, as repeatedly argued throughout prosecution, Tables 2 through 6 in the specification demonstrate that various factors impact the properties of the resulting cutting tool, including the starting material in methodology, notably the temperature. **This is sufficient to undermine the Examiner's assertion of inherency.** Applicants need only show that the sintered cubic boron nitride articles of the applied prior art do not **necessarily** exhibit the properties specified in claim 1. The data in the specification clearly show that something more than the reasons assumed by the Examiner are required to establish such inherency, e.g., the nature of the starting material and the temperature. The Examiner can not turn a blind eye on such hard facts and adhere to the assumption that all sintered cubic boron carbide articles exhibit the properties recited in claim 1.

In addition to the foregoing, the following facts are offered for the Examiner's consideration.

Suzuki '260

Suzuki '260 discloses the use of boron nitride having a highly orientated plate-shaped structure, i.e., pyrolitic boron nitride (PBN) as a normal pressure type boron nitride as raw material. In the case of Suzuki '260, using this raw material, a cBN sintered compact is obtained, and the resulting cBN is highly oriented in the (111) direction, while in the x-ray diffraction intensity, the (220) reflection is very weak or is lacking, as is well-known in the art. The sintered compact, in which the crystal is orientated as described above, exhibits anisotropic properties of strength and direction, with a very low strength.

However, the present invention seeks to obtain an isotropic sintered compact having high strength by developing a fine grain and high purity hexagonal normal pressure type boron nitride, capable of increasing the phase conversion efficiency from hexagonal to cubic, not the pyrolific boron nitride. Therefore, the cubic boron nitride sintered compact disclosed in Suzuki '260 exhibits a different structure, and the strength of the cubic boron nitride can not be obtained from the raw materials employed by Suzuki '260. That the raw material impacts the resulting strength properties is also apparent from the data in the specification which the Examiner can **not** refuse to consider. *In re Glaug supra; In re Soni, supra; In re Margolis, supra.*

JP '068

JP '068 seeks to obtain a high wear resistant sintered compact by incorporating carbon in the cubic boron nitride grains for composing the sintered compact or in the grain boundary in the sintered compact. The incorporated carbon functions as an impurity in the sintered compact to increase phonon scattering in the grain boundaries, thereby lowering the thermal conductivity,

which can only be achieved by a high purity cBN sintered compact. In other words, JP'068 discloses a sintered compact containing impurities introduced solely for the purpose achieving high wear resistance and hence, does not suggest high strength and high thermal conductivity according to the present invention.

Based upon the foregoing, Applicants submit that the Examiner has not established a sufficient factual basis to support a prima facie case of lack of novelty under 35 U.S.C. §102. Moreover, the Examiner has not made the requisite "clear and particular" factual findings as to a specific understanding and specific technological principle which would have realistically impelled one having ordinary skill in the art to modify the sintered cubic boron nitride articles of the applied prior art to arrive at this claimed invention, much less explain, based upon such facts, why one having ordinary skill in the art would have been so motivated. *In re Lee, __F.3d__, 61 USPQ2d 1430 (Fed Cir. 2002); Ecolochem Inc. v. Southern California Edison, Co. 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000).*

Applicants, therefore, submit that the imposed rejection of claims 1, 2 and 4 through 8 under 35 U.S.C. §102 for lack of novelty or, alternatively, under 35 U.S.C. §103 for obviousness predicated upon Suzuki '260 and JP '068, each taken along is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 9 and 10 were rejected under 35 U.S.C. §103 for obviousness predicated upon Kawasaki in view of Suzuki '260.

In the statement of the rejection, the Examiner adhered to the conclusion that one having ordinary skill in the art would have been motivated to employ the methodology and resulting hexagonal boron nitride particles of Kawasaki et al in producing the cubic boron nitride composite of Suzuki '260.

This rejection is traversed as factually or legally erroneous.

Applicants again maintain that the Examiner did not make the requisite "clear and particular" findings upon which to reasonably conclude that one having ordinary skill in the art would have been realistically impelled to employ the hexagonal boron nitride particles disclosed by Kawasaki et al. in forming the products disclosed by Suzuki '260, apart from improperly relying upon generalizations. *In re Lee, supra; Ecolochem Inc. v. Southern California Edison, supra.*

As argued in the May 14, 2001 Amendment, in accordance with the present invention, hBN raw material is converted into **hard cBN**, Kawasaki et al. merely disclose the use of hBN particles in forming sintered bodies. It is not apparent **why** one having ordinary skill in the art would have somehow **zeroed** in on the **particular** hBN particles produced by Kawasaki et al. for the purpose of **sintering** and then employ them in the methodology Suzuki '260 apart from improper relying upon Applicants' disclosure. *Panduit Corp. v. Dennison Mfg. Co., 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985).*

Moreover, as previously pointed out, Suzuki '260 employ PBN to obtain a cBN sintered compact which is highly oriented in the (111) structure and, hence, exhibits anisotropic properties in strength and direction, with a very low strength. However, in accordance with the present invention, isotropic properties are optimized, thereby obtaining high strength by

developing a fine grain and high purity hexagonal normal pressure type of boron nitride, capable of increasing the phase conversion efficiency from hexagonal to cubic not the pirolytic boron nitride.

Accordingly, a prima facie basis to deny patentability to the invention defined in claims 9 and 10 has not been established. Applicants, therefore, submit that the imposed rejection of claims 9 and 10 under 35 U.S.C. §103 for obviousness predicated upon Kawasaki et al. in view of Suzuki '260 is not factually or legally viable and, hence, solicit withdrawal thereof.

It should, therefore, be apparent that the imposed rejections have been overcome and that this application is in clear condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

Arthur J. Steiner
Registration No. 26,106

600 13th Street, N.W.
Washington, DC 20005-3096
(202) 756-8000 AJS:ntb
Date: March 21, 2002
Facsimile: (202) 756-8087

APPENDIX

(March 21, 2002)

Claims 1 and 9 now read as follows:

1. (Twice Amended) A cutting tool comprising, as an edge part, a cubic boron nitride sintered compact containing cubic boron nitride having an average grain diameter of at most 1 μm, in which the cubic boron nitride sintered compact has, at the said edge part, an $I_{(200)}$, $/I_{(111)}$ of (220) diffraction intensity ($I_{(200)}$ to (111) diffraction intensity $I_{(111)}$ ratio of at least 0.05 in X-ray diffraction of arbitrary direction and impurities are substantially not contained in the grain boundaries, wherein the traverse rupture strength of the said cubic boron nitride sintered compact is at least 80 kgf/mm^2 by a three point bending measurement at a temperature between 20°C and 1000°C and the thermal conductivity of the cubic boron nitride sintered compact, at the said edge part, is 250 to 1000 $W/m \cdot K$.

9. (Amended) A process for the production of a sintered compact for a cutting tool containing cubic boron nitride with an average grain diameter of at most 1 μm, which comprises reducing and nitriding boron oxide or boric acid in the presence of carbon and nitrogen to synthesize a low pressure phase boron nitride and subjecting the resulting low pressure phase boron nitride, as a starting material, to direct conversion into cubic boron nitride at a high temperature and high pressure, while simultaneously sintering.